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2004
AMENDMENTS
to the
Program of Studies: Career and Technology Studies
Junior and Senior High Schools

1. **Replace** Career and Technology Studies, page 4, with **revised** Career and Technology Studies, page 4.

2. **Replace** Career Transitions, pages 11, 14, 17, 20, 23, 24 and 25, with **revised** Career Transitions, pages 11, 14, 17, 20, 23, 24 and 25.

   Course withdrawal:
   - CTR2020: Taking the Lead

   Course revisions (Course descriptions have been revised for clarification):
   - Project Courses—CTR1110, CTR1120, CTR2110, CTR2120, CTR2130, CTR2140, CTR2150, CTR3110, CTR3120, CTR3130, CTR3140, CTR3150
   - Practicum Courses—CTR3040, CTR3050, CTR3060, CTR3070, CTR3080

   Prerequisite change:
   - CTR2020: Taking the Lead is no longer a prerequisite for CTR3020: Organizational Leadership

3. **Replace** Communication Technology, pages 11 and 17, with **revised** Communication Technology, pages 11 and 17.

   Course withdrawal:
   - COM2010: Presentation & Communication 2

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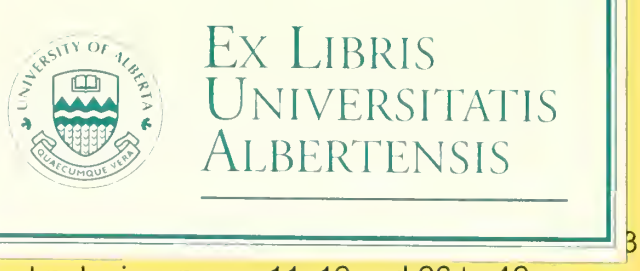

4. **Repl** 33, with **revised** Electro-Technologies, pages 11, 12 and 26 to 42.

New courses:

- ELT2310: Network Structures
- ELT2320: Network Media & Devices
- ELT2330: OSI Model (Open System Interconnection)
- ELT2340: Network Protocols
- ELT2350: Local Area Networks
- ELT3310: Network Operating Systems
- ELT3320: Routing Fundamentals
- ELT3330: Wide Area Networks
- ELT3340: Internet Processes
- ELT3350: Network Management

5. **Replace** Foods, pages 11, 18, 19, 25 and 27, with **revised** Foods, pages 11, 18, 19, 25 and 27.

Course revisions:

- FOD2030: Food Decisions & Health
- FOD2060: Milk Products & Eggs
- FOD3010: Food for the Life Cycle

Prerequisite change:

- FOD1010: Food Basics is no longer a prerequisite for
  FOD2150: Food Safety & Sanitation

PROGRAM OUTCOMES

The program outcomes describe the basic competencies integrated throughout the CTS program.

Within an applied context relevant to personal goals, aptitudes and abilities; *the student* in CTS *will*:

- demonstrate the basic knowledge, skills and attitudes necessary for achievement and fulfillment in personal life
- develop an action plan that relates personal interests, abilities and aptitudes to career opportunities and requirements
- use technology effectively to link and apply appropriate tools, management and processes to produce a desired outcome
- develop basic competencies (employability skills), by:
  - selecting relevant, goal-related activities, ranking them in order of importance, allocating necessary time, and preparing and following schedules (managing learning)
  - linking theory and practice, using resources, tools, technology and processes responsibly and efficiently (managing resources)
  - applying effective and innovative decision-making and problem-solving strategies in the design, production, marketing and consumption of goods and services (problem solving and innovation)
  - demonstrating appropriate written and verbal skills, such as composition, summarization and presentation (communicating effectively)
  - participating as a team member by working cooperatively with others and contributing to the group with ideas, suggestions and effort (working with others)
  - maintaining high standards of ethics, diligence, attendance and punctuality, following safe procedures consistently, and recognizing and eliminating potential hazards (demonstrating responsibility).

PROGRAM ORGANIZATION

CURRICULUM STRUCTURE

Career and Technology Studies is organized into **strands** and **courses**.

Strands in CTS define competencies that help students:

- build daily living skills
- investigate career options
- use technology (managing, processes, tools) effectively and efficiently
- prepare for entry into the workplace and/or related post-secondary programs.

In general, strands relate to selected industry sectors offering positive occupational opportunities for students. Some occupational opportunities require further education after high school, and some allow direct entry into the workplace. Industry sectors encompass goods-producing industries, such as agriculture, manufacturing and construction; and service-producing industries, such as business, health, finance and insurance.

Courses are the building blocks for each strand. They define what a student is expected to know and be able to do (exit-level *competencies*). Courses also specify prerequisites. Recommendations for course parameters, such as instructional qualifications, facilities and equipment can be found in the guides to implementation.

The competencies a student must demonstrate to achieve success in a course are defined through *general outcomes*. Senior high school students who can demonstrate the general outcomes defined for a CTS course; i.e., who have the designated competencies, will qualify for 1 credit toward their high school diploma.

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Specific outcomes provide a more detailed framework for instruction. Within the context of the general outcomes, the specific outcomes further define the knowledge, skills and attitudes the student should acquire.

The following chart shows the 22 strands that comprise the CTS program and the number of 1-credit courses available in each strand.

Strand	No. of Courses
1. Agriculture	33
2. Career Transitions	31
3. Communication Technology	34
4. Community Health	31
5. Construction Technologies	46
6. Cosmetology Studies	58
7. Design Studies	31
8. Electro-Technologies	47
9. Energy and Mines	26
10. Enterprise and Innovation	8
11. Fabrication Studies	44
12. Fashion Studies	29
13. Financial Management	16
14. Foods	37
15. Forestry	21
16. Information Processing	53
17. Legal Studies	13
18. Logistics	12
19. Management and Marketing	20
20. Mechanics	54
21. Tourism Studies	24
22. Wildlife	17

LEVELS OF ACHIEVEMENT

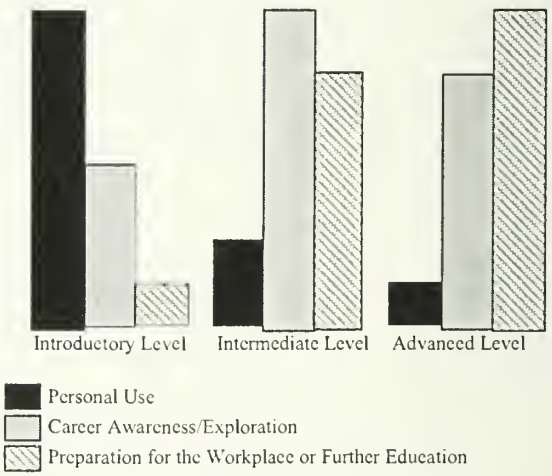
Courses are organized into three levels of achievement: **introductory**, **intermediate** and **advanced**. As students progress through the levels, they will be expected to meet higher standards and demonstrate an increased degree of competence, in both the program outcomes and the general outcomes defined for individual courses.

Introductory level courses help students build daily living skills and form the basis for further learning. Introductory courses are for students who have no previous experience in the strand.

Intermediate level courses build on the competencies developed at the introductory level. They provide a broader perspective, helping students recognize the wide range of related career opportunities available within the strand.

Advanced level courses refine expertise and help prepare students for entry into the workplace or a related post-secondary program.

The graph below illustrates the relative emphasis on the aspects of career planning at each of the levels.



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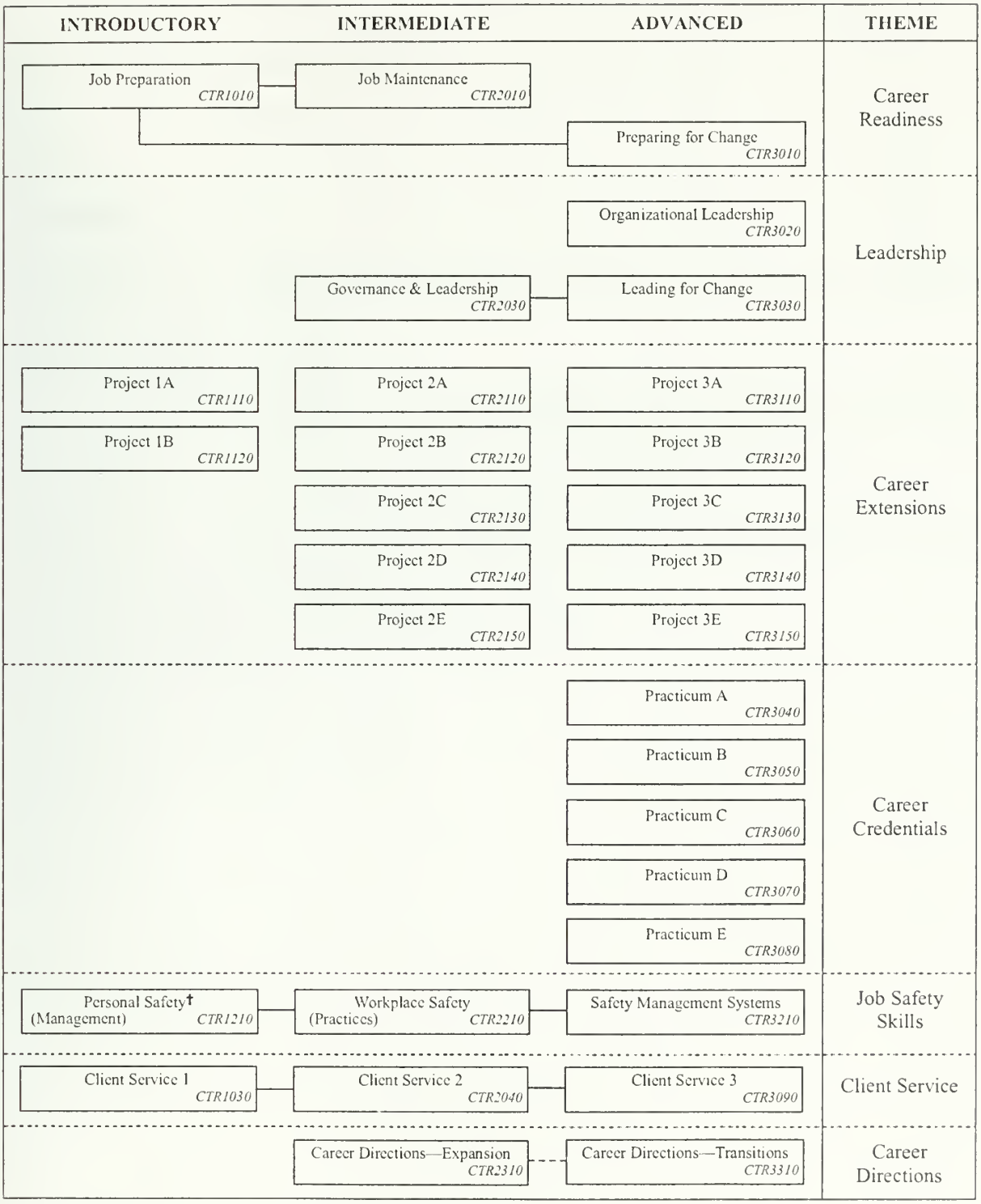
SCOPE AND SEQUENCE



——— Prerequisite ----- Recommended Sequence

† Course is also offered in Community Health.

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GENERAL OUTCOMES: INTRODUCTORY LEVEL

COURSE CTR1010: JOB PREPARATION

Level: Introductory

Theme: Career Readiness

Prerequisite: None

Description: Students develop successful employment search skills and a personal employment search portfolio.

General Outcomes: *The student will:*

- identify and develop knowledge, skills and attitudes appropriate for conducting successful employment searches
- communicate in the language in which business is conducted
- prepare a personal employment search portfolio
- use technologies, tools and information systems appropriately for job preparation
- demonstrate basic competencies.

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COURSE CTR1030: CLIENT SERVICE 1

Level: Introductory

Theme: Client Service

Prerequisite: None

Description: Students are introduced to the principles and practices of client service. The learning acquired through other CTS courses is extended and enhanced, and opportunities are provided for students to apply and to integrate, in real-life contexts, the knowledge, skills and attitudes developed through other courses.

The context of instruction for this course is determined by the other CTS strands to which it is linked.

General Outcomes: *The student will:*

- define "client service" and explain the relationship between "client" and "service"
- identify and describe the scope of client services available to clients
- demonstrate and record basic client services, including:
  - applications of competencies learned in other courses
  - communication skills
  - safety practices
- demonstrate basic competencies.

COURSE CTR1110: PROJECT 1A
COURSE CTR1120: PROJECT 1B

Level: Introductory

Theme: Career Extensions

Prerequisite: None

Description: Students, through projects, extend and enhance competencies developed in the Career Transitions strand or other Career and Technology Studies strands to contexts that are personally relevant.

Note: The project courses may not be delivered as stand-alone courses, nor may they be combined with core courses.

General Outcomes: *The student will:*

- propose, manage and assess a project
- meet goals as defined within the project plan
- demonstrate basic competencies.

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GENERAL OUTCOMES: INTERMEDIATE LEVEL

COURSE CTR2010: JOB MAINTENANCE

Level: Intermediate

Theme: Career Readiness

Prerequisite: CTR1010 Job Preparation

Description: Students acquire knowledge about workplace requirements, rights and responsibilities and relate this knowledge to personal career/employment expectations.

General Outcomes: *The student will:*

- identify and develop knowledge, skills and attitudes appropriate to acquiring and maintaining employment
- identify and describe employment support agencies, employment centres and employment legislation
- demonstrate basic competencies.

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COURSE CTR2030: GOVERNANCE & LEADERSHIP

Level: Intermediate

Theme: Leadership

Prerequisite: None

Description: Students are introduced to governance, its place within the administrative structure of a school or community, including the roles, responsibilities, practices and procedures for participating in governance and leadership.

General Outcomes: *The student will:*

- describe and explain the purpose of a governance structure
- participate in leadership activities within a school, volunteer agency or a community governance structure
- demonstrate leadership in a governance role
- demonstrate basic competencies.

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COURSE CTR2040: CLIENT SERVICE 2

Level: Intermediate

Theme: Client Service

Prerequisite: CTR1030 Client Service 1

Description: Students expand on the principles and practices of client service previously developed. The learning acquired by students in CTR1030 Client Service 1 is extended and enhanced, and additional opportunities are provided for students to develop client service abilities by applying and integrating, in real-life contexts, the knowledge, skills and attitudes developed through other courses.

The context of instruction for this course is determined by the other CTS strands to which it is linked.

General Outcomes: *The student will:*

- distinguish between client needs and wants and be able to reconcile expressed needs with service needs
- demonstrate and record advanced client services, including:
  - applications of competencies learned in other courses
  - ethical behaviour
  - sales ability
  - quality control
  - marketing
  - client service management
- identify, explain and apply basic quality control principles and practices
- identify, explain and apply basic sales and marketing strategies
- demonstrate basic competencies.

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COURSE CTR2110: PROJECT 2A
COURSE CTR2120: PROJECT 2B
COURSE CTR2130: PROJECT 2C
COURSE CTR2140: PROJECT 2D
COURSE CTR2150: PROJECT 2E

Level: Intermediate

Theme: Career Extensions

Prerequisite: None

Description: Students, through projects, extend and enhance competencies developed in the Career Transitions strand or other Career and Technology Studies strands to contexts that are personally relevant.

Note: The project courses may not be delivered as stand-alone courses, nor may they be combined with core courses.

General Outcomes: *The student will:*

- propose, manage and assess a project
- meet goals as defined within the project plan
- demonstrate basic competencies.

COURSE CTR2210: WORKPLACE SAFETY (PRACTICES)

Level: Intermediate

Theme: Job Safety Skills

Prerequisite: CTR1210 Personal Safety (Management)

Description: Students explore workplace safety principles and practices, and apply these principles and practices to a variety of contexts.

General Outcomes: *The student will:*

- identify and describe hazard assessments and controls
- classify accidents and incidents and explain causation
- define ergonomics and describe its relationship to workplace safety
- demonstrate and describe standards/legislated practices associated with workplace safety, including:
  - farm/urban safety
  - fire safety
  - electrical safety
  - confined space safety
  - transportation of dangerous goods
- demonstrate basic competencies.

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GENERAL OUTCOMES: ADVANCED LEVEL

COURSE CTR3010: PREPARING FOR CHANGE

Level: Advanced

Theme: Career Readiness

Prerequisite: CTR1010 Job Preparation

Description: Students develop knowledge and skills relating to the changing labour market, and relate these changes to analyzing and refining personal career plans.

General Outcomes: *The student will:*

- analyze the role of government and labour unions in relation to employers and employees
- gather and analyze appropriate labour market information related to selected occupations and incorporate the findings into a personal career plan
- demonstrate basic competencies.

COURSE CTR3020: ORGANIZATIONAL LEADERSHIP

Level: Advanced

Theme: Leadership

Prerequisite: None

Description: Students develop an understanding of the concept of organizations, and demonstrate leadership by establishing an organization and leading it to achieve a stated goal.

General Outcomes: *The student will:*

- explain the similarities and differences between leadership practices and management practices
- demonstrate leadership by establishing an organization, leading it to achieve a stated goal, and assessing the process and outcome
- demonstrate basic competencies.

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COURSE CTR3030: LEADING FOR CHANGE

Level: Advanced

Theme: Leadership

Prerequisite: CTR2030 Governance & Leadership

Description: Students investigate change and decision-making processes used in the school and/or community. They construct, propose and initiate the use of a project planning model to affect change.

General Outcomes: *The student will:*

- describe the change and decision-making processes used in a governance structure
- identify and record the organizational structures used in a school and in a community
- construct, propose and initiate the use of a project planning model
- demonstrate basic competencies.

COURSE CTR3040: PRACTICUM A
COURSE CTR3050: PRACTICUM B
COURSE CTR3060: PRACTICUM C
COURSE CTR3070: PRACTICUM D
COURSE CTR3080: PRACTICUM E

Level: Advanced

Theme: Career Credentials

Prerequisite: None

Description: Students, on the worksite, continue to develop and refine those competencies developed in related Career and Technology Studies courses, previous practicums and other experiences.

Note: The practicum courses may be accessed only by students continuing to work towards attaining a recognized credential offered by an agency external to the school. Practicum courses extend the competencies developed in related CTS strands. The practicum courses may not be delivered as stand-alone courses, nor may they be combined with core courses. These courses may not be used in conjunction with Registered Apprenticeship Program courses. The practicum courses must be delivered off-campus and be supervised by both a qualified teacher and an experienced professional authorized to supervise trainees for the external credential.

General Outcomes: *The student will:*

- perform assigned tasks and responsibilities efficiently and effectively as required by the credentialling agency
- analyze personal performance in relation to established standards
- demonstrate basic competencies.

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COURSE CTR3090: CLIENT SERVICE 3

Level: Advanced

Theme: Client Service

Prerequisite: CTR2040 Client Service 2

Description: Students build on the principles and practices of client service acquired in CTR2040 Client Service 2. Additional opportunities are provided for students to apply and to integrate, in real-life contexts, the knowledge, skills and attitudes developed through other courses.

The context of instruction for this course is determined by the other CTS strands to which it is linked.

General Outcomes: *The student will:*

- demonstrate and record professional client services, including:
  - applications of competencies learned in other courses
  - ethical behaviour
  - client service enhancement strategies
- demonstrate advanced quality control and marketing strategies
- manage client services
- demonstrate basic competencies.

COURSE CTR3110: PROJECT 3A
COURSE CTR3120: PROJECT 3B
COURSE CTR3130: PROJECT 3C
COURSE CTR3140: PROJECT 3D
COURSE CTR3150: PROJECT 3E

Level: Advanced

Theme: Career Extensions

Prerequisite: None

Description: Students, through projects, extend and enhance competencies developed in the Career Transitions strand or other Career and Technology Studies strands to contexts that are personally relevant.

Note: The project courses may not be delivered as stand-alone courses, nor may they be combined with core courses.

General Outcomes: *The student will:*

- propose, manage and assess a project
- meet goals as defined within the project plan
- demonstrate basic competencies.

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COURSE CTR3210: SAFETY MANAGEMENT SYSTEMS

Level: Advanced

Theme: Job Safety Skills

Prerequisite: CTR2210 Workplace Safety (Practices)

Description: Students conduct an in-depth investigation of safety management systems and demonstrate the ability to design a safety program for a selected business/industry.

General Outcomes: *The student will:*

- define "loss control" and describe "loss control" practices in a selected business/industry
- design a safety program for a selected business/industry, and specify safety management practices, standards and documentation requirements/ procedures
- gather and analyze accident/incident information, identify causation and recommend preventive measures
- demonstrate basic competencies.

COURSE CTR3310: CAREER DIRECTIONS—TRANSITIONS

Level: Advanced

Theme: Career Directions

Prerequisite: None

Description: Students build on work done in CTR2310: Career Directions—Expansion to update their learning/career plan, and to ensure their career tool kit can support them as they make the transition from high school into the workplace or post-secondary learning.

General Outcomes: *The student will:*

- refine and present the career portfolio targeting specific applications related to personal career plans
- describe the career paths of two individuals working in different industry sectors in terms of their career planning and transition experiences
- update learning/career planner and expand personal career network/resource list
- update and assess personal career transition scenarios, including:
  - links to personal competencies, interests and goals
  - career planning process and principles
  - expectations and opportunities (potential career paths)
  - labour market and workplace trends
- refine and/or expand action plans to enhance essential competencies and to build learning capacity.

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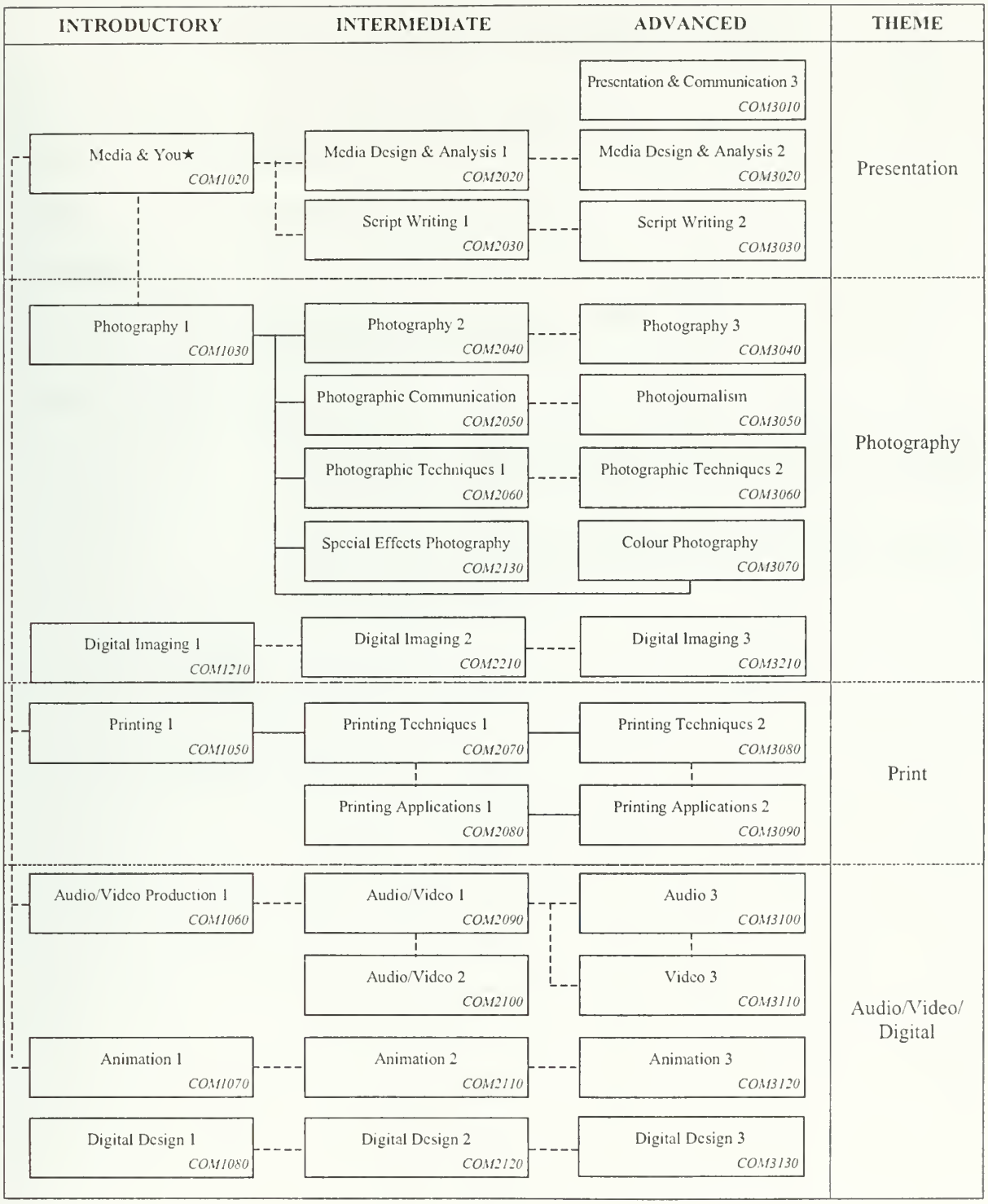
SCOPE AND SEQUENCE



——— Prerequisite ----- Recommended sequence

★ Course provides a strong foundation for further learning in this strand.
Note: Presentation & Communication 1 has been withdrawn effective September 2003.

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GENERAL OUTCOMES: INTERMEDIATE LEVEL

COURSE COM2020: MEDIA DESIGN & ANALYSIS 1

Level: Intermediate

Theme: Presentation

Prerequisite: None

Description: Students explore various media and examine their impact on personal, community and national interests.

General Outcomes: *The student will:*

- analyze various media messages; e.g., radio, television, photography, print; and describe the impact of the various messages from a personal, community and national perspective
- design and produce simple messages, and communicate them through specified media; e.g., print, audio/video, animation
- demonstrate basic competencies.

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COURSE COM2030: SCRIPT WRITING 1

Level: Intermediate

Theme: Presentation

Prerequisite: None

Description: Students write sample scripts for a variety of media forms.

General Outcomes: *The student will:*

- describe various media scripts and their formats
- identify the characteristics of a good script
- identify and use a script writing process in writing sample scripts for a media format assigned by the teacher
- demonstrate basic competencies.

COURSE COM2040: PHOTOGRAPHY 2

Level: Intermediate

Theme: Photography

Prerequisite: COM1030 Photography 1

Description: Students review and expand on the concepts outlined in COM1030 Photography 1, including composition, exposure, camera operation, image processing, proofing and enlarging.

General Outcomes: *The student will:*

- apply exposure principles and composition guidelines in photography assignments
- demonstrate proficiency in the theory and practice of image processing, proofing, enlarging and print display
- demonstrate basic competencies.

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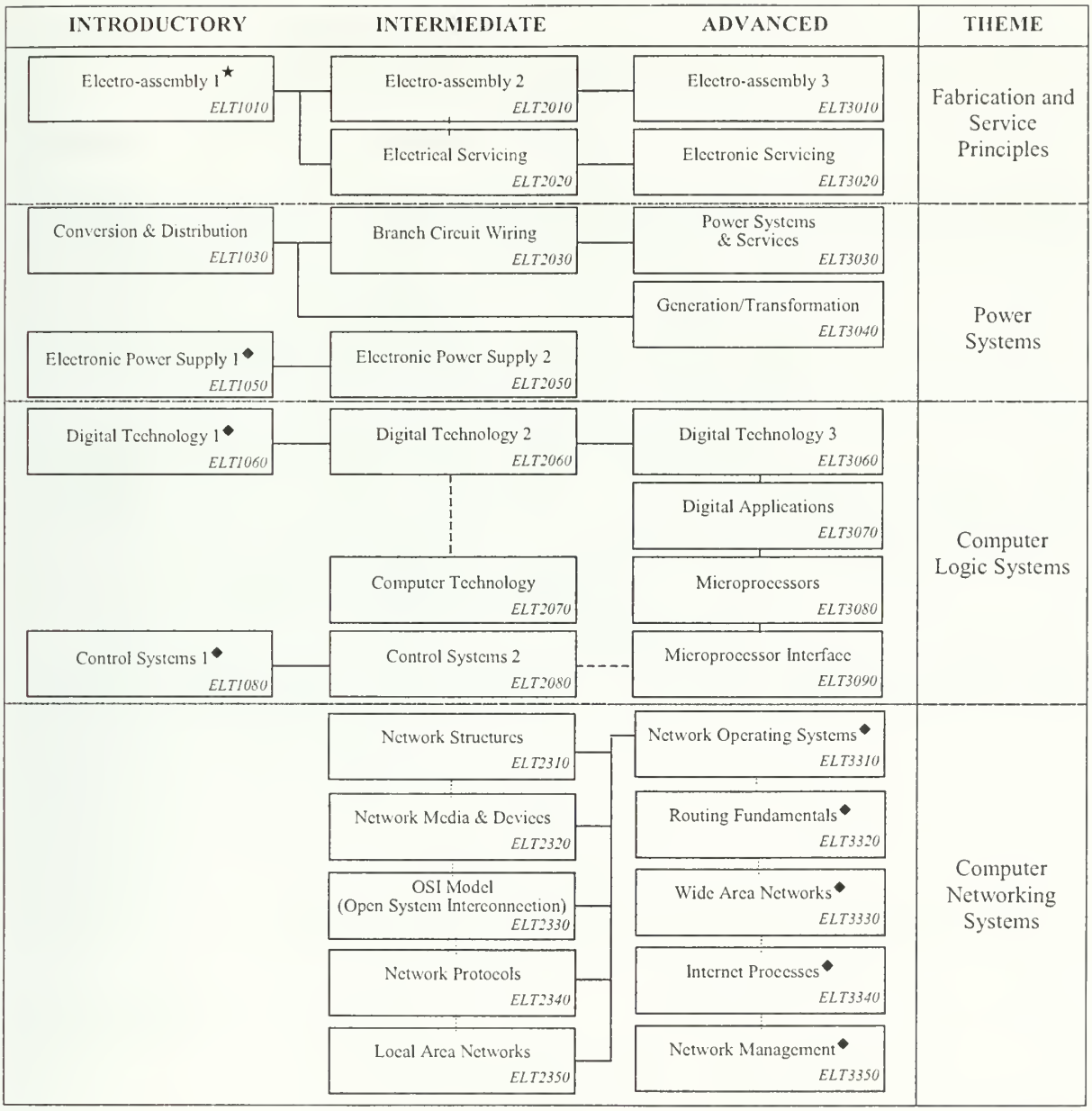
SCOPE AND SEQUENCE



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——— Prerequisite - - - - - Recommended sequence

★ Course provides a strong foundation for further learning in this strand.

◆ Refer to specific courses for additional prerequisites.

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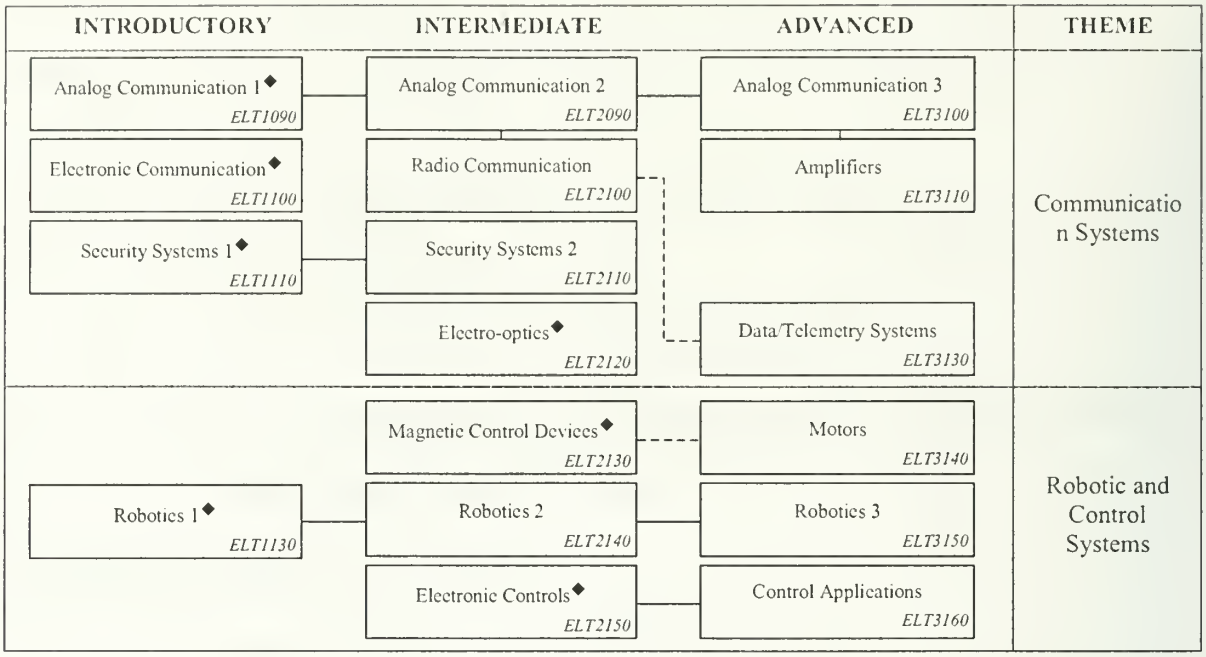
SCOPE AND SEQUENCE (continued)



——— Prerequisite - - - - - Recommended sequence

★ Course provides a strong foundation for further learning in this strand.

◆ Refer to specific courses for additional prerequisites.

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COURSE ELT2140: ROBOTICS 2

Level: Intermediate

Theme: Robotic and Control Systems

Prerequisite: ELT1130 Robotics 1

Description: Students demonstrate the fundamental concepts of sensor devices and control systems, by building an electronic circuit to control a direct wire or mobile robot.

General Outcomes: *The student will:*

- design and build a sensor device and control system for the robotic system
- identify sensor control systems and subsystems used in robotic systems
- explain sensory control circuits and components used in the robotic control system
- operate and demonstrate the capabilities of a robotic system equipped with sensor controls
- demonstrate established laboratory procedures and safe work practices
- demonstrate basic competencies.

COURSE ELT2150: ELECTRONIC CONTROLS

Level: Intermediate

Theme: Robotic and Control Systems

Prerequisite: ELT2130 Magnetic Control Devices

Description: Students demonstrate the fundamentals of ladder/relay logic programming, and demonstrate how the program's logic controller system operates.

General Outcomes: *The student will:*

- explain basic input and output hardware and fundamentals of basic programming in programmable logic controller systems
- write a basic programming logic code, through real or programmed inputs on a programmable logic system, to operate and control electromagnetic devices
- wire, operate and test a programmable electromagnetic device
- demonstrate established laboratory procedures and safe work practices
- demonstrate basic competencies.

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COURSE ELT2310: NETWORK STRUCTURES

Level: Intermediate

Theme: Computer Networking Systems

Prerequisite: None

Description: Students acquire an understanding of network infrastructure and assess the advantages and disadvantages of different types of networks. They also develop knowledge of data transmission principles in a computer network and compare features of different network topologies and transmission methods.

General Outcomes: *The student will:*

- describe and explain the evolution of computer networks, and the general structure and function of:
  - peer-to-peer and server-based networks
  - local area networks and wide area networks
- describe and demonstrate basic principles of data transmission in a computer network
- describe and compare the features of:
  - bus, star, ring, mesh, wireless and hybrid topologies
  - Ethernet, token ring, Fibre Distributed Data Interface (FDDI) and wireless transmission methods
- demonstrate established laboratory procedures and safe work practices
- identify career paths in computer networking
- demonstrate basic competencies.

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COURSE ELT2320: NETWORK MEDIA & DEVICES

Level: Intermediate

Theme: Computer Networking Systems

Prerequisite: None

Description: Students develop an understanding of different connectivity strategies for linking computers and other devices in a local area network (LAN). They acquire knowledge of industry standards for network cables and gain practical experience through installing cabling, connectors and other hardware components.

General Outcomes: *The student will:*

- identify and describe the characteristics, standard names and applications for common network media and connectors
- identify and explain the purpose, features and basic operation of network hardware components
- demonstrate knowledge of cabling tools; and demonstrate ability to install network cabling, connectors and hardware components
- demonstrate established laboratory procedures and safe work practices
- identify and describe career paths and employment opportunities in network infrastructure design and installation
- demonstrate basic competencies.

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COURSE ELT2330: OSI MODEL (Open System Interconnection)

Level: Intermediate

Theme: Computer Networking Systems

Prerequisite: None

Description: Students develop knowledge of the Open System Interconnection (OSI) reference model and its use as a conceptual framework for analyzing network communication tasks. They examine OSI reference model characteristics, the functions of each of its seven layers, and how data moves between layers of the reference model when computers establish a network connection.

General Outcomes: *The student will:*

- describe the general purpose and structure of the OSI reference model as a conceptual framework for network communication
- explain and illustrate how hardware components, network protocols and encapsulation defined in lower layers of the OSI reference model move data across the network; i.e.:
  - physical layer
  - data link layer
  - network layer
  - transport layer
- explain the function of upper layers of the OSI reference model in providing client support; i.e.:
  - session layer
  - presentation layer
  - application layer
- demonstrate established laboratory procedures and safe work practices
- identify and describe information and communication technology careers within the context of the OSI reference model
- demonstrate basic competencies.

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COURSE ELT2340: NETWORK PROTOCOLS

Level: Intermediate

Theme: Computer Networking Systems

Prerequisite: None

Description: Students acquire basic knowledge of upper-layer protocol suites that permit the networking of computers. They examine reasons for the extensive use of the Transmission Control Protocol/Internet Protocol (TCP/IP) in computer networks, and develop knowledge and skills relevant to installing, configuring and maintaining a TCP/IP client on a network.

General Outcomes: *The student will:*

- describe and compare standard networking protocol suites with respect to function, addressing requirements, interoperability and naming conventions
- identify and explain reasons for the extensive use of the TCP/IP suite in computer networks, and identify and explain major protocols that operate within the TCP/IP suite
- demonstrate basic knowledge of logical addressing, and the use of subnets and subnet masks to maximize address utilization
- demonstrate ability to:
  - install and configure TCP/IP on a user work station
  - validate, troubleshoot and manage a network connection using TCP/IP utilities
- demonstrate established laboratory procedures and safe work practices
- demonstrate basic competencies.

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COURSE ELT2350: LOCAL AREA NETWORKS

Level: Intermediate

Theme: Computer Networking Systems

Prerequisite: None

Description: Students extend their understanding of technologies used in a local area network (LAN) and examine specifications for an Ethernet LAN. They develop knowledge of a general strategy for network design and apply the strategy to design, implement and troubleshoot a small LAN.

General Outcomes: *The student will:*

- describe and explain the nature and evolution of LAN technologies and the specific features that differentiate one LAN from another
- explain and demonstrate characteristics of an Ethernet LAN and strategies for improving network performance
- describe the characteristics, function and benefits of a virtual local area network (VLAN)
- design and implement a small LAN
- analyze and troubleshoot basic problems related to LAN design and implementation
- demonstrate established laboratory procedures and safe work practices
- demonstrate basic competencies.

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GENERAL OUTCOMES: ADVANCED LEVEL

COURSE ELT3010: ELECTRO-ASSEMBLY 3

Level: Advanced

Theme: Fabrication and Service Principles

Prerequisite: ELT2010 Electro-assembly 2

Description: Students apply photographic processes to construct a printed circuit for an electronic project.

General Outcomes: *The student will:*

- identify three photographic printed circuit (PC) board construction methods
- design or modify a board layout to be used for photographic PC board construction
- construct a PC board, using a photographic method
- assemble a project, using a PC board
- demonstrate established laboratory procedures and safe work practices
- demonstrate basic competencies.

COURSE ELT3020: ELECTRONIC SERVICING

Level: Advanced

Theme: Fabrication and Service Principles

Prerequisite: ELT2020 Electrical Servicing

Description: Students develop and apply basic processes and skills to service and repair consumer-based electronic products.

General Outcomes: *The student will:*

- use a block diagram to show the function and the stages of operation of an electronic device
- identify system faults, and propose solutions to service and repair various digital and analog consumer products
- use standard, safe practices to service/repair an electronic component or device
- create a profile of a trade or occupation within the field of electronic servicing
- demonstrate basic competencies.

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COURSE ELT3030: POWER SYSTEMS & SERVICES

Level: Advanced

Theme: Power Systems

Prerequisite: ELT2030 Branch Circuit Wiring

Description: Students construct, operate, analyze and evaluate various single-phase and three-phase power systems and services.

General Outcomes: *The student will:*

- follow established, safe laboratory procedures and practices when working with three-phase systems
- construct and analyze a three-wire, single-phase electrical system
- analyze common reluctance inductance (RLC) vector diagrams
- construct and analyze three-wire, three-phase and four-wire, three-phase wye systems
- construct and analyze three-wire, three-phase delta systems
- create a profile of a trade or occupation within the field of power systems and services
- demonstrate basic competencies.

COURSE ELT3040: GENERATION/TRANSFORMATION

Level: Advanced

Theme: Power Systems

Prerequisite: ELT1030 Conversion & Distribution

Description: Students operate, experiment with and analyze alternators and transformers used in power generation and distribution.

General Outcomes: *The student will:*

- explain the principles of operation of electrical components used in safety devices
- set up and operate three-phase low voltage alternators in no load and load conditions
- explain the operational and loading parameters for alternators
- operate a low voltage alternator in parallel with another alternator(s)
- describe the operating principles of single-phase transformers
- identify fundamental loading characteristics of single-phase transformers
- demonstrate established laboratory procedures and safe work practices
- demonstrate basic competencies.

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COURSE ELT3060: DIGITAL TECHNOLOGY 3

Level: Advanced

Theme: Computer Logic Systems

Prerequisite: ELT2060 Digital Technology 2

Description: Students demonstrate knowledge of digital principles by using medium-scale transistor–transistor logic (TTL) and complementary metal oxide semiconductor (CMOS) integrated technology.

General Outcomes: *The student will:*

- identify, interface and experiment with medium-scale integrated circuit (IC) families
- identify components, construct a prototype and experiment with typical medium-scale logic networks
- demonstrate established laboratory procedures and safe work practices
- create a profile of a trade or occupation within the field of digital technology
- demonstrate basic competencies.

COURSE ELT3070: DIGITAL APPLICATIONS

Level: Advanced

Theme: Computer Logic Systems

Prerequisite: ELT3060 Digital Technology 3

Description: Students experiment with large-scale and very large-scale integrated circuits, and demonstrate their applications to practical situations.

General Outcomes: *The student will:*

- identify applications and develop prototypes of large-scale integrated circuits
- troubleshoot a digital system or prototype with digital equipment
- demonstrate established laboratory procedures and safe work practices
- demonstrate basic competencies.

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COURSE ELT3080: MICROPROCESSORS

Level: Advanced

Theme: Computer Logic Systems

Prerequisite: ELT3070 Digital Applications

Description: Students compare the internal architecture of microprocessors and program them, using instruction sets.

General Outcomes: *The student will:*

- compare the internal architecture of various families of microprocessors
- program a microprocessor, using instruction sets
- describe input/output operations in microprocessors
- demonstrate established laboratory procedures and safe work practices
- demonstrate basic competencies.

COURSE ELT3090: MICROPROCESSOR INTERFACE

Level: Advanced

Theme: Computer Logic Systems

Prerequisite: ELT3080 Microprocessors

Description: Students demonstrate how to interface microprocessors/microcontrollers with real-world applications.

General Outcomes: *The student will:*

- describe microprocessor interface output and input circuits
- explain the operation of a serial interface device
- interface a digital-to-analog (D/A) and analog-to-digital (A/D) converter to a microprocessor
- connect a microprocessor to a sensor device used in home, industrial and/or transportation applications
- demonstrate established laboratory procedures and safe work practices
- demonstrate basic competencies.

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COURSE ELT3100: ANALOG COMMUNICATION 3

Level: Advanced

Theme: Communication Systems

Prerequisite: ELT2090 Analog Communication 2

Description: Students demonstrate the principal concepts of electronic analog communication systems.

General Outcomes: *The student will:*

- identify and demonstrate applications of analog communication
- explain differences between analog communication circuit applications used in telephone systems and consumer audio equipment
- demonstrate established laboratory procedures and safe work practices
- create a profile of a trade or occupation within the field of analog communication
- demonstrate basic competencies.

COURSE ELT3110: AMPLIFIERS

Level: Advanced

Theme: Communication Systems

Prerequisite: ELT3100 Analog Communication 3

Description: Students demonstrate knowledge of various types and classes of amplifiers.

General Outcomes: *The student will:*

- explain the differences among various types and classes of amplifiers
- construct, analyze and test amplifier circuits and components
- maintain, test and troubleshoot a power amplifier
- demonstrate established laboratory procedures and safe work practices
- demonstrate basic competencies.

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COURSE ELT3130: DATA/TELEMETRY SYSTEMS

Level: Advanced

Theme: Communication Systems

Prerequisite: None

Description: Students demonstrate the fundamentals of various data/telemetry systems, and demonstrate their applications to the real world.

General Outcomes: *The student will:*

- distinguish the difference between analog and digital carriers with voice or data transmission
- explain data/telemetry communication through experimentation, circuit analysis and project work
- construct a voice or data transmission network
- demonstrate established laboratory procedures and safe work practices
- demonstrate basic competencies.

COURSE ELT3140: MOTORS

Level: Advanced

Theme: Robotic and Control Systems

Prerequisite: None

Description: Students demonstrate knowledge of electric motor operation and loading characteristics.

General Outcomes: *The student will:*

- explain electromotive principles as applied to direct current (DC) and single-phase alternating current (AC) motors
- explain the operational characteristics of common DC and AC motors
- set up selected DC and AC motors, and demonstrate their loading characteristics
- demonstrate established laboratory procedures and safe work practices
- create a profile of a trade or occupation within the field of electric motors
- demonstrate basic competencies.

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COURSE ELT3150: ROBOTICS 3

Level: Advanced

Theme: Robotic and Control Systems

Prerequisite: ELT2140 Robotics 2

Description: Students demonstrate remote/autonomous control systems, by constructing circuits to control robotic behaviour.

General Outcomes: *The student will:*

- identify and assemble the required components to build a frequency remote control or microprocessor control for a robotic unit
- identify various microprocessor control systems and subsystems used in robotic units
- explain frequency control or microprocessor control circuits and components in robotic units
- operate a robotic system that has various feedback controls
- demonstrate established laboratory procedures and safe work practices
- create a profile of a trade or occupation within the field of robotics
- demonstrate basic competencies.

COURSE ELT3160: CONTROL APPLICATIONS

Level: Advanced

Theme: Robotic and Control Systems

Prerequisite: ELT2150 Electronic Controls

Description: Students demonstrate the fundamentals of programmed controls, and demonstrate how sensing devices are integrated to control output devices.

General Outcomes: *The student will:*

- identify and describe input and output hardware components and the methods of programming
- use programming logic, including real or programmed inputs, to control electromagnetic devices
- use various instruction codes to operate and control electromagnetic devices
- demonstrate established laboratory procedures and safe work practices
- demonstrate basic competencies.

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COURSE ELT3310: NETWORK OPERATING SYSTEMS

Level: Advanced

Theme: Computer Networking Systems

Prerequisite:
ELT2310: Network Structures
ELT2320: Network Media & Devices
ELT2330: OSI Model (Open System Interconnection)
ELT2340: Network Protocols
ELT2350: Local Area Networks

Description: Students examine the features, advantages and disadvantages of major network operating systems, and the criteria involved in selecting network operating systems that are appropriate in specific networking environments. They develop knowledge and skills required to install and configure different network and client operating systems, and develop a strategy for troubleshooting problems resulting from the installation of operating system software.

General Outcomes: *The student will:*

- identify the generic functions and administrative tasks common to all network operating systems
- describe and compare specific capabilities and functions of current versions of network operating systems in common use
- identify and analyze criteria relevant to planning for, selecting and implementing a network operating system
- demonstrate ability to install and configure two or more network operating systems and compatible network clients
- demonstrate ability to analyze and troubleshoot connectivity problems related to the installation of operating system software
- demonstrate established laboratory procedures and safe work practices
- demonstrate basic competencies.

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COURSE ELT3320: ROUTING FUNDAMENTALS

Level: Advanced

Theme: Computer Networking Systems

Prerequisite:
ELT2310: Network Structures
ELT2320: Network Media & Devices
ELT2330: OSI Model (Open System Interconnection)
ELT2340: Network Protocols
ELT2350: Local Area Networks

Description: Students extend their knowledge of wide area networks (WANs) by examining the process by which information is routed through an internetwork. They examine the major functions and components of a router, develop knowledge of common routing protocols, and gain practical experience in basic router configuration.

General Outcomes: *The student will:*

- describe the process of routing data through an internetwork, and describe the major functions of a router
- explain and analyze the addressing and routing function of protocols operating at the network layer of the Open System Interconnection (OSI) reference model
- demonstrate knowledge of router components, commands and configuration processes
- describe and explain methods used to manage and monitor network routing
- demonstrate established laboratory procedures and safe work practices
- demonstrate basic competencies.

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COURSE ELT3330: WIDE AREA NETWORKS

Level: Advanced

Theme: Computer Networking Systems

Prerequisite:
ELT2310: Network Structures
ELT2320: Network Media & Devices
ELT2330: OSI Model (Open System Interconnection)
ELT2340: Network Protocols
ELT2350: Local Area Networks

Description: Students develop basic knowledge of the technologies employed in a wide area network (WAN) and of how a WAN may be used to connect local area networks (LANs) at different locations. They gain practical experience in using WAN technologies to establish remote network access, and they analyze emerging WAN technologies with respect to impact on global networking.

General Outcomes: *The student will:*

- describe the general structure, function and communication services provided by a WAN
- explain and illustrate basic concepts of circuit switching and packet switching and their application in a WAN
- demonstrate applications of WAN technology in providing network users with remote access
- identify and describe security issues in a WAN and the function of network security protocols and methods
- analyze emerging WAN technologies with respect to design, evolution and impact on global networking
- demonstrate established laboratory procedures and safe work practices
- demonstrate basic competencies.

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COURSE ELT3340: INTERNET PROCESSES

Level: Advanced

Theme: Computer Networking Systems

Prerequisite:
ELT2310: Network Structures
ELT2320: Network Media & Devices
ELT2330: OSI Model (Open System Interconnection)
ELT2340: Network Protocols
ELT2350: Local Area Networks

Description: Students apply their knowledge of wide area network (WAN) technologies to an Internet environment. Course content focuses on the significance and utility of Internet Protocol (IP) addressing schemes in Internet communication and on the function of WAN protocols and services in providing Internet access. Students develop knowledge of internetworking career paths and related educational opportunities.

General Outcomes: *The student will:*

- describe and analyze the historical roots, basic architecture and functions of the Internet in global communication
- develop a rationale for, and demonstrate the use of, IP addressing schemes, subnets and subnet masks in Internet communication
- explain and compare the function of selected WAN protocols and services, and their utility in providing access to the Internet
- identify and assess methods for connecting a local network infrastructure with the Internet
- identify and describe internetworking career paths and employment opportunities, as well as related education and certification requirements
- demonstrate established laboratory procedures and safe work practices
- demonstrate basic competencies.

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COURSE ELT3350: NETWORK MANAGEMENT

Level: Advanced

Theme: Computer Networking Systems

Prerequisite:
ELT2310: Network Structures
ELT2320: Network Media & Devices
ELT2330: OSI Model (Open System Interconnection)
ELT2340: Network Protocols
ELT2350: Local Area Networks

Description: Students acquire knowledge of internal and external risks to a network and develop strategies for protecting network data and securing a network. They also develop and apply a general strategy for troubleshooting network problems and acquire knowledge of the basic roles and responsibilities associated with network maintenance and support.

General Outcomes: *The student will:*

- provide a rationale for protecting network data, and describe major components of a data backup strategy
- analyze security risks in a local area network (LAN), and describe steps that can be taken to secure a network
- demonstrate an understanding of the functions and key roles of network maintenance and support in an organization
- use appropriate strategies, tools and commands to troubleshoot common network problems
- identify and describe career paths and employment opportunities in network maintenance and support
- demonstrate established laboratory procedures and safe work practices
- demonstrate basic competencies.

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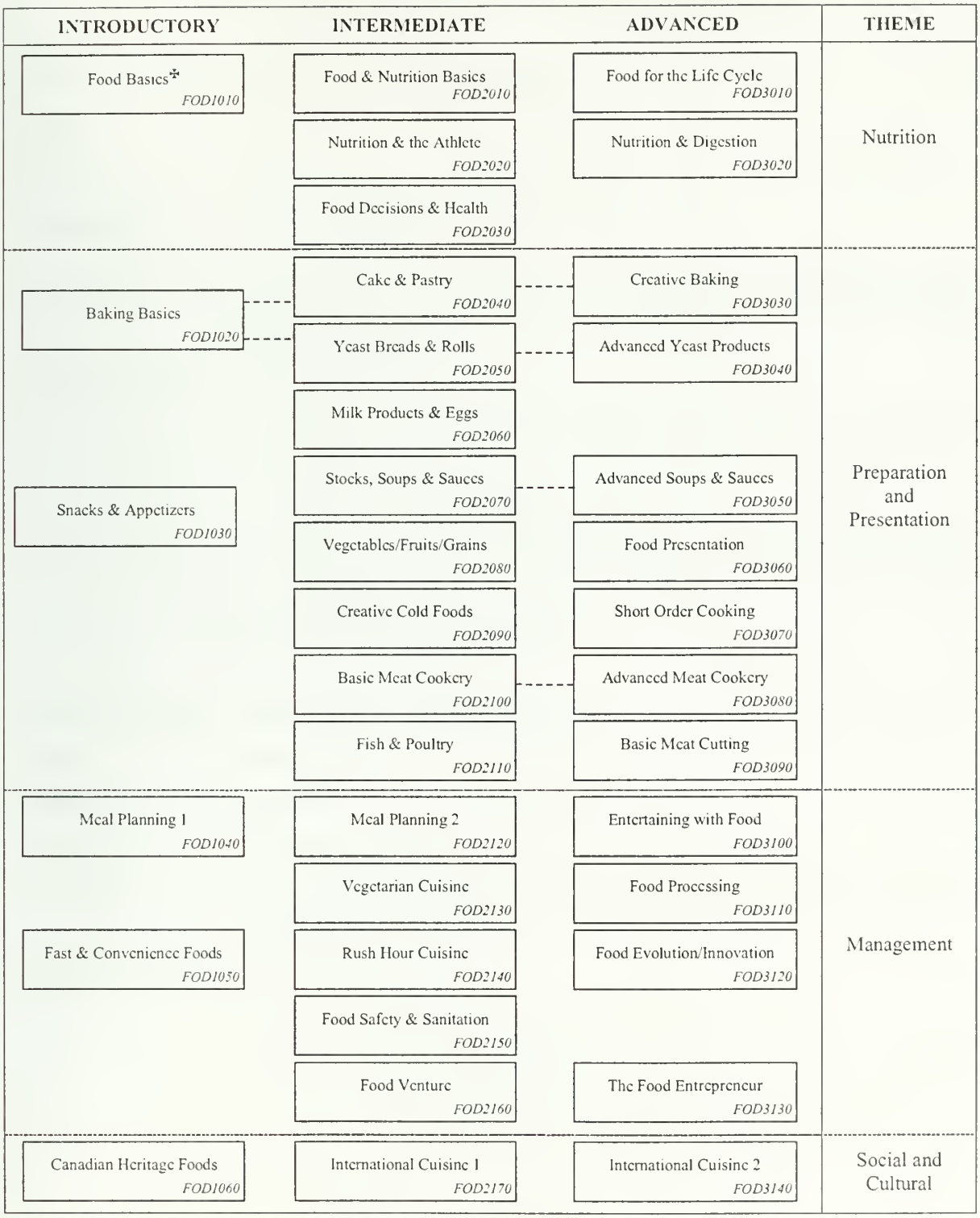
SCOPE AND SEQUENCE



——— Prerequisite - - - - - Recommended sequence

* Prerequisite to most courses in this strand.

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GENERAL OUTCOMES: INTERMEDIATE LEVEL

COURSE FOD2010: FOOD & NUTRITION BASICS

Level: Intermediate

Theme: Nutrition

Prerequisite: FOD1010 Food Basics

Description: Students learn which foods are crucial to wellness; how such foods affect current performance and future health; and discover how to choose and prepare nutritious, tasty foods.

General Outcomes: *The student will:*

- identify and describe the interrelationships among food choices, nutrients and wellness
- describe the importance of high fibre and low fat diets in ensuring wellness
- interpret nutrition information
- prepare, compare and analyze a wide variety of high quality nutritional foods
- describe the personal or career relevance of the competencies developed within the course
- demonstrate basic competencies.

COURSE FOD2020: NUTRITION & THE ATHLETE

Level: Intermediate

Theme: Nutrition

Prerequisite: FOD1010 Food Basics

Description: Students learn to prepare foods that help athletes to meet their training and performance nutritional needs.

General Outcomes: *The student will:*

- describe the role of food and nutrients in athletic performance
- identify and describe strategies for achieving optimal nutrition for the athlete
- interpret nutrition information and misinformation directed to the athlete
- select, prepare and evaluate foods that will meet the athlete's needs
- describe the personal or career relevance of the competencies developed within the course
- demonstrate basic competencies.

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COURSE FOD2030: FOOD DECISIONS & HEALTH

Level: Intermediate

Theme: Nutrition

Prerequisite: FOD1010 Food Basics

Description: Students learn how to balance the energy equation, using strategies for food intake analysis, and by preparing appropriate foods that help the body be the best it can.

General Outcomes: *The student will:*

- describe the relationships among body image, wellness, healthy eating and active living
- describe strategies for achieving and maintaining adequate food intake, as per *Canada's Food Guide to Healthy Eating*, and healthy active living, as per *Canada's Physical Activity Guide to Healthy Active Living*
- identify and critique media influences on body image
- select, prepare and evaluate foods suitable for achieving growth and development during teen years
- describe the personal or career relevance of the competencies developed within the course
- demonstrate basic competencies.

COURSE FOD2040: CAKE & PASTRY

Level: Intermediate

Theme: Preparation and Presentation

Prerequisite: FOD1010 Food Basics

Description: Students expand their knowledge and skills in the production of a variety of cakes and pastries.

General Outcomes: *The student will:*

- identify the role of cakes and pastries in Canadian cuisine, considering nutrition, cultural and social traditions
- describe the function of ingredients in the production of cakes and pastries
- prepare and evaluate cakes and pastries, demonstrating conventional techniques
- describe the personal or career relevance of the competencies developed within the course
- demonstrate basic competencies.

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COURSE FOD2050: YEAST BREADS & ROLLS

Level: Intermediate

Theme: Preparation and Presentation

Prerequisite: FOD1010 Food Basics

Description: Students describe the role of ingredients and use specialized skills in working with yeast.

General Outcomes: *The student will:*

- identify and describe the factors involved in the preparation of yeast products
- prepare and evaluate a variety of yeast products
- describe the personal or career relevance of the competencies developed within the course
- demonstrate basic competencies.

COURSE FOD2060: MILK PRODUCTS & EGGS

Level: Intermediate

Theme: Preparation and Presentation

Prerequisite: FOD1010 Food Basics

Description: Students develop skills with milk products and eggs, and compare the various products available, what they contribute to cooked foods and how they are best used.

General Outcomes: *The student will:*

- identify and compare various milk products and eggs, considering nutritive value, processing and handling
- describe the role of eggs in various cooking applications
- demonstrate the principles of milk cookery and egg cookery in the preparation and evaluation of a variety of products
- describe the personal or career relevance of the competencies developed within the course
- demonstrate basic competencies.

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COURSE FOD2070: STOCKS, SOUPS & SAUCES

Level: Intermediate

Theme: Preparation and Presentation

Prerequisite: FOD1010 Food Basics

Description: Students combine stocks with various thickening agents to produce basic stocks, hearty soups and foundation sauces.

General Outcomes: *The student will:*

- identify the ingredients used in the preparation of white and brown stocks
- describe the key thickening and flavouring agents in the production of sauces and soups
- demonstrate correct techniques in the preparing and safe handling of white and brown stocks
- prepare and evaluate clear and cream soups and foundation sauces
- describe the personal or career relevance of the competencies developed within the course
- demonstrate basic competencies.

COURSE FOD2080: VEGETABLES/FRUITS/GRAINS

Level: Intermediate

Theme: Preparation and Presentation

Prerequisite: FOD1010 Food Basics

Description: Students learn about the wide range of vegetable, fruit and grain products available, and how to retain their nutritional value and quality through a variety of cooking methods.

General Outcomes: *The student will:*

- describe vegetable, fruit and grain products in terms of:
  - variety of types and forms
  - care, handling and storage
  - nutritional value
  - methods and effects of cooking
- prepare and evaluate vegetable, fruit and grain products, using a variety of cooking methods
- describe the personal or career relevance of the competencies developed within the course
- demonstrate basic competencies.

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COURSE FOD2150: FOOD SAFETY & SANITATION

Level: Intermediate

Theme: Management

Prerequisite: None

Description: Students learn about food-borne illnesses and the importance of food safety and sanitation training for anyone handling food in personal, as well as commercial, applications.

General Outcomes: *The student will:*

- describe the relationships among foods, micro-organisms and food-borne illness
- describe measures to prevent food contamination and to control the growth of micro-organisms in food
- describe the role of regulatory agencies and safety programs, such as the Workplace Hazardous Materials Information System (WHMIS), in maintaining a safe and sanitary environment
- demonstrate the safe handling of food in a manner consistent with section 43 of the *Public Health Act* Food Regulation
- describe the personal or career relevance of the competencies developed within the course
- demonstrate basic competencies.

COURSE FOD2160: FOOD VENTURE

Level: Intermediate

Theme: Management

Prerequisite: FOD1010 Food Basics

Description: Students develop entrepreneurial skills through the planning and creation of a food venture.

General Outcomes: *The student will:*

- identify and describe the safety issues relating to the preparation of food for a customer
- show a project plan for a simple food venture
- prepare and evaluate food for a food venture
- describe the personal or career relevance of the competencies developed within the course
- demonstrate basic competencies.

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COURSE FOD2170: INTERNATIONAL CUISINE 1

Level: Intermediate

Theme: Social and Cultural

Prerequisite: FOD1010 Food Basics

Description: Students discover other cultures by exploring their cuisine. They learn a variety of international cooking techniques, and use specialized tools to prepare food for a typical day or for a cultural event.

General Outcomes: *The student will:*

- describe the relationship of food to culture
- identify and compare the foods of a variety of cultures
- prepare foods representative of a variety of cultures
- describe the personal or career relevance of the competencies developed within the course
- demonstrate basic competencies.

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GENERAL OUTCOMES: ADVANCED LEVEL

COURSE FOD3010: FOOD FOR THE LIFE CYCLE

Level: Advanced

Theme: Nutrition

Prerequisite: FOD1010 Food Basics

Description: Students describe how life cycle needs change, and demonstrate how to meet the challenges of each stage, through preparation techniques and the adapting of foods to satisfy all ages.

General Outcomes: *The student will:*

- describe the role food plays in the development, enhancement and maintenance of physical, emotional and social wellness throughout the life cycle
- prepare and evaluate foods for the enhancement of wellness throughout the life cycle
- identify and describe community nutrition programs
- describe the personal or career relevance of the competencies developed within the course, and identify labour market dynamics that may be significant for career choices
- demonstrate basic competencies.

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COURSE FOD3020: NUTRITION & DIGESTION

Level: Advanced

Theme: Nutrition

Prerequisite: FOD1010 Food Basics

Description: Students learn about nutrition and how the body processes food, by appraising current nutritional theories/issues and dietary needs.

General Outcomes: *The student will:*

- describe the processes of digestion, absorption and metabolism in relation to nutrient composition
- explain the role of water, minor vitamins and minerals in achieving and maintaining wellness
- describe nutrient intake, food patterns and diet therapies, considering the prevention and management of disease
- interpret current nutrition controversies
- prepare meal plans with specified nutrient composition
- prepare and evaluate foods for specified meal plans
- describe the personal or career relevance of the competencies developed within the course, and identify labour market dynamics that may be significant for career choices
- demonstrate basic competencies.

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